

August, 1982
NEWSLETTER

\$2⁰⁰

Vol. 2, No. 8

MICHIGAN **A**TARI **C**OMPUTER **E**NTHUSIASTS

This Month . . .

- **Atari Macro Assembler**
- **Symtec Light Pen**
- **Choice Game Reviews**



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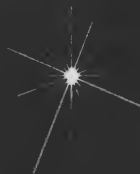
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POKES FROM THE PREZ

By Arlan Levitan

SOFTWARE HAPPENINGS - Adventure International, one of the original second-source suppliers of Atari software has boldly gone where no software house has been before. Not only is their new game Preppie a truly excellent work (see Sheldon Leemon's review of it elsewhere in this issue), but AI has gone off a limb by offering purchasers a single additional archival copy of the protected software for only \$3.99! I applaud this action and challenge those firms that continue to lessen the utility of their products by making it impossible to create an archival copy of legally acquired entertainment software. Even "serious" software purchasers are in the same boat! Atari Inc. has been taken to task by those unfortunate souls who bought Microsoft Basic and found there was no back-up policy in place. I'm tired of reading about the unethical behavior of a small minority of software traders and pirates. It's time for the manufacturers to hold up their end of the bargain! PUT UP OR SHUT UP, FELLAHS! Life is still a two way data bus! Is it reasonable to expect to have your rights respected while you ignore the rights of your users granted by the same copyright law you look to for protection?

ATARI PERSONAL FINANCE RECALL - The Personal Financial Management System has been dropped by Atari. You may remember that MACE member Ed Middlebrook was the first to report the serious bugs in the system earlier this year. A new release was quietly shipped and pulled again when the new version was found to be not much better than the old. Anyone who purchased the package and doesn't have an overwhelming personal attachment to it may receive a full refund of the purchase price by returning it to Atari along with the original sales slip. They'll also throw in a certificate worth \$10 toward the purchase of the APX's home budget system.

TROUBLE AT THE APX - Speaking of the APX, the release of the Summer 1982 catalogue has a lot of tongues wagging. First the Exchange alienated authors by reducing

their royalties on dealer sales while Atari guru Chris Crawford appeared on national TV claiming that APX authors receive a royalty full 10% of retail price. Now they're working on the users. Many new APX products will be protected, with the price of just about everything being raised five dollars to pay for the protection and the new bulky packaging that gives dealers fits. Of course you can still count on APX's media warranty still being the shortest in the business at only 30 days and no upgrade policy for new releases of software. The APX may be a bright spot in Atari at the moment (who wouldn't be at a million bucks per month of product moving?), but it could easily turn into a festering sore if they don't start treating their authors and consumers with a bit more consideration.

MACE ELECTIONS IN SEPT.

- New officers will be elected at our September meeting. I'd like to urge all members to attend and exercise their voting privileges. Nominations for all offices will be accepted from the floor. Got the itch to be involved? All paid up members are eligible to run for any of MACE's elected positions; President, Vice-President, Newsletter Editor, Disk or Tape Librarian, Treasurer, General Meetings Program Director, and Recording or Corresponding Secretary positions are all up for grabs! If you've thought "I can do better than that", this is the time to speak up or forever hold your peace. Here's a quick review of the posts:

President: Hmmmm....I've had this job for a year and I'm still not sure about everything the post entails. The president chairs board and general membership meetings, represents the group in dealings with Atari User Group Support, other user groups and many other community and business organizations. Being president means holding another full-time job and trying the patience of your spouse regularly. Be prepared for both brickbats, roses, hard work, and a lot of fun. This one's wide open folks...one year is usually enough for even the hardest souls (including myself).

Vice President: Now this one's really tough! aside from subbing for the President when necessary, the MACE Veep is also Advertising Manager for the Newsletter. You'll need a lot of spare time and diplomacy to handle this one.

continued

Recording Secretary:

Responsible for taking minutes of general membership and board meetings, and submitting them in polished form to the Newsletter Editor.

Corresponding Secretary:

Handles most of the personal correspondence required by the group.

Tape and Disk Librarians:

Responsible for duplication, collation and sales of the program library at general membership meetings.

Treasurer: Handles the club's finances, membership roster, and does general bookkeeping.

Program Director: Arranges agendas, equipment, set-up, presentations, and main programs for meetings. Also co-ordinates special events.

Newsletter Editor: I've saved the toughest for last. The job of the new Editor will be to try and do a better job than Marshall Dubin has done. In other words, you've got your work cut out for you! Who will be the brave soul to rise to the challenge?

The very size of our group means that many of the elected officials will create staffs to handle much of the work. Please respond to the requests for help from the newly elected officers. Your time and work can help us keep responsive to the needs of the membership and the community at large.

INTERESTED IN PRINTERS? If you haven't heard it elsewhere, be advised that all new Epson MX-80 and MX-100 printers now come equipped with new graphics chips called "Graftrax Plus" at no increase in price. The new chips add superscripting, subscripting and the ability to skip forms perforations to all features of the old Graftrax chips. Good news for Atari owners is that inverse video characters in program listings are printed as italicized characters on Graftrax Plus equipped Epsoms. You may upgrade your present Epson to Graftrax Plus status by purchasing a retrofit kit that includes the three chips and a copy of the newest Epson manual which is much more extensive and informative than the original.

Was this change prompted by the heat generated by the C. Itoh Prowriter (also sold as the NEC 8023 for considerably more coin) and the new Centronics 739? Both of the

latter offer friction and tractor feed, bit graphics, and proportional print fonts. The 739 lists at seven hundred bills and is compatible with all software written for the Atari 825 printer, which is after all, nothing more than a Centronics 737 with a Sunnyvale tan. The Prowriter has been a real sleeper until lately, but when the new release of Text Wizard is shipped this month incorporating support for the C. Itoh and the Epson Graftrax Plus chips, the excellent quality of the Prowriter's proportional font and high printing speed should make it the new darling of Atari owners with the word processing bug.

MICROBUFFER - Also of interest to Epson owners is the Microbuffer from Practical Peripherals. While the serial bus of the Atari is capable of a 19.2K data transfer rate most printers can only print so many characters per second (80 cps for the Epson). This means that your micro is forced to wait for the printer to finish one line before before it can send the next. The Microbuffer stores the data in its own memory buffer and then takes control of the printer, freeing your system to continue on while your Epson churns away.

Model MBP-16k at \$159 is available now and gives you a 16k buffer. Contrary to some of the ads I have seen, it is NOT user-upgradable to 32k. The 16k version will hold the equivalent of a 132 sector disk text file at one throw, certainly enough for most casual word processing. Model MBP-64k will offer four times the capacity and carry a price tag of \$300. Either model fits the existing auxiliary interface connector inside the Epson 80 or 100 without modification. Should be a real boon to impatient printer users. Make sure the Microbuffer you purchase has a Revision 2.1.1 EPROM on it. Some of the earlier chips contain a bug that causes Epsoms hooked to Atari's to miss the first character in a printed line. If you can't find one with a revised chip, Practical Peripherals will sell you an updated version at no charge.

FULL-VIEW 80 - I've been using a Bit 3 Full-View 80 card in my Atari 800 for about 2 weeks now courtesy of the folks at RWE in Warren (Thanks Ed) and I'm convinced that the product is both reliable and useful for those with a real need for an 80 column display. There are a couple Of hitches though:

1. Since the card resides in the last

continued

memory slot of the 800 you must use a 32K card if you want to run a full 48K machine (Dave Small tells me that owners of the Leading Edge disk drive system may plug the board into the system expansion cage provided with the drive.

2. You must use a high bandwidth monochrome monitor for the 80 column display. Sorry folks, the only thing you'll get out of your color sets and non-RGB monitors will be a severe case of eyestrain. This isn't the fault of the BIT 3 board. Blame it on Zenith, RCA, et.al.

3. There's not a great deal of software designed especially for use with it. LJK has 80 column versions of Letter Perfect, Data Perfect and Edit 6500. The first release of Letter Perfect I tested was buggy. A new one is on the way. Some existing software, including the MACE Terminal may be made to work with the board. The general rule is: No Graphics 0 = No 80 columns.

The question is, do you really NEED an eighty column board? Some folks might greatly appreciate the capability. I will be reporting in detail on my experiences with the product in our September issue and you can decide for yourself.

TAKE A RIDE ON THE READING!

- Several new books of interest to Atarians have been released. "Your Atari Computer: A Guide to Atari 400/800 Personal Computers", by Poole, McNiff and Cook is an excellent introduction to computer concepts and the special features of your Atari. For machine code programmers, "6502 Assembly Language Subroutines", by Levalthal and Saville includes over fifty handy generic routines for bit fiddlers. "Atari Games and Recreations" by Kohl, Kahn, Lindsay & Cleland teaches Basic programming in an entertaining context. What should have been the rest of the Basic book that came with your 800 is available now. "Atari Sound and Graphics", penned by Moore, Lower, & Albrecht, is a definite improvement in both style and presentation over the dry and simplistic Albrecht text printed by the same company. Interested in learning about the FORTH language? "Starting Forth" is acknowledged to be the best beginners text available. ①

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S.I.G. NEWS

SIG-UTILITIES

At the last meeting of our group we reviewed text editors and word processors. Demonstrations were given on the LKJ Letter Perfect, Text Wizard, and the APX Text Editor. We had a copy of the Atari Text Editor, but (don't laugh now) nobody knew how to use it and we had no demonstration.

SIG-BASIC

Schedule of meetings:

August 24...intermediate level users

September 9...beginners

September 21...advanced

For directions and information call Kim Spitzer at 543-0961.

REVIEW OF DOWNHILL

By Chuck Hawkins
GAMES SIG

(A.P.X.)

If skiing is your bag, this is your game. A skier skis downhill avoiding poles and trees for the fastest time. Downhill is a (1) player game that is hard to master. You have your choice of (3) skill levels, depending on your skiing abilities. I suggest you start on the beginner level and work your way up. Once you think you have mastered a particular level, you can increase the speed to make the level more difficult.

This program is reasonably priced and is a different addition to ones library. I would like to thank Rite-Way Enterprises for their cooperation in my review of DOWNHILL.

MACE LIBRARY NOTES

By Howard D. Rabotnick

If you have been having trouble understanding any of the MACE Program Library software, then help is on the way. I will be trying to tackle the task of documentation, and will soon be publishing some reasonable instruction sheets for each volume of the library.

Unfortunately, I am not a technical genius when it comes to computers. I have only had mine for a year, so I am learning too. If you come across a question that I can't answer, I'm sure that someone else in our club will be able to. Please understand that I am referring to documentation questions only, and all your other technical questions should be referred to our resident genius, Craig Chamberlain.

Any comments regarding documentation of our library would be greatly appreciated. If you would like to help us in this task (even just a little bit), then please contact me. Also, let's start a policy of submitting programs to the library with at least a short paragraph or two explaining how the program works.

To help expand the growth of the MACE library, we are asking MACE members to donate non-copyrighted programs to the library. Submissions by MODEM can be made by calling CHET GONTERMAN at 313-553-7443. These programs will be available to members only.

If you would like to submit something to our BBS, that number is 868-2064, and the command is U for upload. Submissions are subject to approval.

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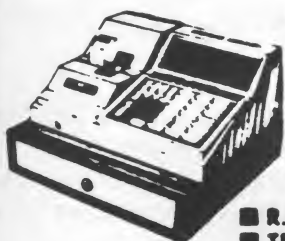
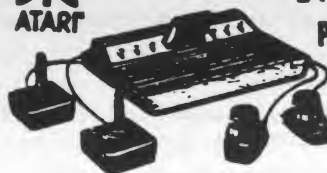
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Initial experience with ATARI's new Macro Assembler

By Phil Heavin

The timing of the introduction of ATARI's Macro Assembler (AMAC) couldn't have been better for me. The arcade game program I was writing had grown to over 200 disk blocks in size and required 8 minutes to assemble using the Assembler Editor Cartridge (AEC) even with all listings turned off. Even though the source program could fit into memory of my 48k machine my latest addition exceeded the limit of the symbol table. There isn't any obvious way to change this limit so I was facing the prospect of a delay while I wrote a relocating linker so that the program could be broken up into smaller pieces. David Small's description of the Macro Assembler at the May MACE meeting sounded like just the solution to my problem. The following is a description of my experience in starting to use AMAC.

The editor included on the AMAC disk is the Program-Text Editor which has been available for some time from APX. Several of the other languages introduced lately, FORTH and PASCAL are also expecting source files produced by an editor of this type. The major change that a BASIC or AEC programmer will notice is that the source lines are not line numbered. The editor is a forward and backward scrolling screen editor which can remember and execute very powerful editing commands. I like this type of screen editor which is by default always in the insert mode, but this can be a bit disconcerting to someone who has never used this type of editor. Because there is less memory left over after this editor is loaded, my program would no longer fit into memory, even though removing the line numbers reduced its size to about 160 disk blocks. This was not a serious problem since this editor can handle files that are longer than available memory.

My first strategy was to change only the parts of my program that had to be changed to accommodate the syntax required by AMAC. The following is a checklist of these differences from the AMAC manual.

- The Macro Assembler does not accept line numbers.

- The = for EQU must be embedded between at least two blanks.

- Comments must be preceded by a semicolon.

- The following pseudo-ops are recognized by the Macro Assembler:

.BYTE is equivalent to DB

.END is equivalent to END

.PAGE is equivalent to TITLE

.SKIP is equivalent to SPACE

.WORD is equivalent to DW

- The following are NOT recognized by the Macro Assembler:

BYTE

WORD

- The Macro Assembler does not recognize * = for setting the origin counter; use ORG instead.

- All strings must be bracketed by quotation marks (") for the Macro Assembler to interpret them properly.

I just quoted the manual on the last one, the examples and my experience show that strings must be bracketed by apostrophes('). In addition, now labels must be unique in the first six characters.

Most of these changes were just simple editing functions to correct the syntax of the statements. The only one that caused me any problem was that labels now must be unique in the first six characters. Since the AEC allowed long labels I had used meaningful labels wherever possible. About a dozen of my labels were not unique so I had to dream up some new shorter names. The entire conversion took only a couple of evenings and the same program was then running after being assembled in only 2 minutes!

The next step was to break the program

continued

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into several smaller chunks so that editing was much easier. Even though the editor can edit files larger than memory it's much simpler if a source file will fit into memory. There two pseudo-operations and one command line option which will combine several files into one assembly - System Text file, INCLUDE, and LINK.

Several of you may be asking, "Now what do I do with my Assembler Editor Cartridge?". It is still a very useful tool since AMAC does not include either a disassembler or any kind of debugger. Object files produced by AMAC are compatible with the LOAD command of AEC and, unlike the 'L' option of DOS, it will not branch to the run address so you can insert BRK's with the debugger before starting at the run address. After booting the AEC you must type a LOMEM command whose address is greater than the end of your program. The LOMEM command must be the first command typed after the boot.

My only bad experience came when trying to use the more advanced features of the assembler, that is the macros and conditional assembly. Most of the problems were fairly minor and you are not likely to encounter them. I will give you the list I know of in next months article about macros. There are, however, two bugs which are likely to jump up and bite you. All documentation in the manual show an optional address on the END pseudo-operation which will be used as the run address when the object file is loaded. However this address MUST be supplied so if you don't want your program to automatically run at LOAD time this address should point to an RTS instruction. The other is a limitation on the size of Macros that is not mentioned anywhere in the manual. This limit is 255 characters. Exceeding 255 characters does not directly produce any assembler error but the macro expansion stops, and this can indirectly cause a multitude of assembler errors that have nothing to do with the real cause.

What is a Macro and how do I write one?

The ATARI Macro Assembler Manual says, "The macro feature allows you to define code words to represent multiple instructions. It makes it easy for you to use a sequence of code many times in a program." All this means is that as you write assembler programs and

find yourself saying, "This is a real pain, this is the fifth time I've had to write something like this today.", you have just found a good use for a macro. Let's take a look at a typical example.

In an assembly program you often need to move a 16 bit value, usually an address, but data two bytes long is common. We can write a "move word" macro like this:

```
MOVW  MACRO FROM,TO
      LDA  %1
      STA  %2
      LDA  %1+1
      STA  %2+1
      ENDM
```

This must appear near the top of your program before you use the MOVW macro. The words 'FROM' and 'TO' are for documentation purposes only to remind you of the arguments when reading the macro. When invoked, as shown below, the first argument will be substituted wherever '%1' appears and the second wherever '%2' appears. Now anywhere in your program that you need to move two bytes you only type:

```
MOVW  WORD1,WORD2
```

Where 'WORD1' and 'WORD2' are the labels of variables in your program.

The code assembled will be:

```
LDA  WORD1
STA  WORD2
LDA  WORD1+1
STA  WORD2+1
```

Now typing the one line is equivalent to typing all four lines. But let's complicate matters a little by realizing that often it is a constant loaded in immediate mode that you want to move. We will add to our existing macro. Lets say that we will indicate an immediate argument for 'FROM' by surrounding it with brackets, '[' and ']' and that we want MOVW to work just like it did before in addition to assembling the correct instructions to move a constant to a word location. Here's the new macro, I'll explain it in detail below:

```
MOVW  MACRO FROM,TO
      IF '[' <= '%1' & '%1' <= '['ZZZZZZ'
```

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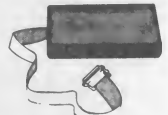
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```

LDA #LOW%1
STA %2
LDA #HIGH%1
STA %2+1
ELSE
LDA %1
STA %2
LDA %1+1
STA %2+1
ENDIF
ENDM

```

The IF...ELSE...ENDIF is new so let's examine it and then show the results of using this new macro. The IF tests the condition specified and then assembles only one of the two groups. The program statements between the IF and the ELSE are assembled if the condition is true and the statements between the ELSE and the ENDIF will be assembled if the condition is false. The ELSE clause is optional, so in some cases you may use the IF...ENDIF construct. IF's can be nested as we will see in an example in the next article but for now let's keep it simple.

The condition looks a little wierd so let's look at that for a minute. We want to test to see if the first argument is surrounded by brackets. It's really sufficient just to test that the first character is '['. Unfortunately there isn't a way to separate out that first character to test it, so instead we will check the whole thing by treating the entire argument as a string. The greater than (>) and less than (<) operators function on strings using the ATASCII sequence to determine the order of the strings. After treating the first argument as a string, by putting apostrophes around it, we can check that it falls between '[' and '[]]]]]'. A look at the ATASCII table should convince you that this will catch any reasonable argument that starts with '['.

Let's see how this works by looking at the output of the macro assembler. Please note that this is not the exact output but has been slightly modified here for readability.

ATARI Macro Assembler Ver 1.0A

```

0000 = 1D00    ORG    $1D00
1D00    START

```

LIST G,-M

```

1D00    MOVW WORD1,WORD2

```

```

1D00+AD791D    LDA    WORD1
1D03+8DAD1D    STA    WORD2
1D06+AD7A1D    LDA    WORD1+1
1D09+8DAE1D    STA    WORD2+1

```

```

1D0C          MOVW [WORD11,WORD2
1D0C+A979    LDA    #LOW[WORD1]
1D0E+8DAD1D    STA    WORD2
1D11+A91D    LDA    #HIGH[WORD1]
1D13+8DAE1D    STA    WORD2+1

```

```

1D16 = 0063    DS    99
1D79 0000 WORD1 DW    0
1D7B = 0032    DS    50
1DAD 0000 WORD2 DW    0
1DAF          END    START

```

no ERRORS, 3 Labels, \$4A2B free.

Note that the lines listed with a '+' are automatically generated by the macro shown in the previous paragraph but not shown in the program listing above for brevity. You didn't have to type those lines (or have the opportunity to make a mistake in them). If you prefer to not see the generated instructions the list command would have been:

LIST -M

You may have noticed that the instructions generated by this macro always uses the 'A' register. Since this is not always desirable let's change our macro and add a few more very simple macros that will greatly increase the flexibility of the MOVW macro. First, here is a modified version of the above macro that will allow us to specify the register to be used:

```

MOVWR MACRO REG, FROM, TO
IF '[' <= '%2' & '%2' <= '[]]]]]'
LD%1    #LOW%2
ST%1    %3
LD%1    #HIGH%2
ST%1    %3+1
ELSE
LD%1    %2
ST%1    %3
LD%1    %2+1
ST%1    %3+1
ENDIF
ENDM

```

continued

We don't intend to use the MOVWR macro directly but rather one of the following simple macros:

```
MOVW: MACRO FROM,TO
    PHA
    MOVWA %1,%2
    PLA
    ENDM
```

```
MOVWA MACRO FROM,TO
    MOVWR A,%1,%2
    ENDM
```

```
MOVWX MACRO FROM,TO
    MOVWR X,%1,%2
    ENDM
```

```
MOVWY MACRO FROM,TO
    MOVWR Y,%1,%2
    ENDM
```

Now, while writing a program if you know that a register, say the Y register, does not currently contain a useful value you can do a 2 byte move with the following instruction:

```
MOVWY WORD1,WORD2
```

Which will generate:

```
LDY WORD1
STY WORD2
LDY WORD1+1
STY WORD2+1
```

If all of the registers contain values you want to remain the same after the move you use:

```
MOVW WORD1,WORD2
```


Which will generate:

```
PHA
LDA WORD1
STA WORD2
LDA WORD1+1
STA WORD2+1
PLA
```

The same move will be done but all three registers will be the same after the move.

Even though we have spent quite a bit of

space with this explanation, I hope that you can see that this is a simple example of the application of macros to a common problem. This can be expanded so that your new 'instructions' could completely define a new language that doesn't even resemble 6502 assembler code. By using different sets of macros you can change 'languages' depending on the type of program you are writing or you could use macros to emulate the assembler code of a different processor chip. Just like other forms of programming, the only limit is your imagination.

In the next article we'll tackle a tougher problem and see even more of the power of macros. 

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DATA PERFECT

By Ed Middlebrook

For many, many months I had a recurring dream ... I would walk into my local software temple and find a database program that would meet my requirements. It had to be fast, user-friendly (without smothering), contain a quick sort routine, a modifiable report generator, and allow me to create my database as I wanted, not the way the programmer wanted me to. Every time a new database program hit the market I ran to see if it would be the answer to my quest. Alas, none of the ones I had looked at was the one for me. Despair began to set in ... was I doomed to failure in my search? Then along came the answer to my prayers - Data Perfect. With a smile on my face and a song in my heart I rushed home to spend the rest of my days in bliss with my fantastic new discovery.

That was the review I wished I could write. Unfortunately, we live in a real world of compromises and economics. Data Perfect is an excellent database system, and yet, left me with a few reservations.

Data Perfect is from LJK Enterprises, the same people who gave us Letter Perfect. In fact, one of the big selling points of Data Perfect is that the databases from Data Perfect may be input into Letter Perfect. Data Perfect comes in an attractive vinyl binder with chapter dividers and a nice front pocket for holding the program disk. Advertised as one of the best database programs on the market, it is a professional looking package selling for \$99.95.

The specs on Data Perfect are impressive. First of all, the screen display is entirely free-format. When you create your database, you also decide how the data is to be displayed on the screen, such as which field goes where, how many characters in each field, and so on. Up to 32 fields may be defined per database, with up to 16 of them being formula fields (fields whose values are based on other fields and computed automatically as data is entered). A field may be up to 127 characters long, with an overall record length of up to 511 characters (255 if the data is to be transferred to Letter Perfect). Fields may be

alphanumeric, date, number, or formula. The number of records in your database is limited to the number of records which may fit on a disk, which of course depends on how large your individual records are. A database I built for Atari magazine articles has records of 127 characters long and will hold 511 on a disk.

The other functions of Data Perfect are equally impressive. Searching is allowed on up to 8 criteria at 2 per field (maximum of 4 fields) plus a record number range for a maximum of 9 separate criteria. Seven search parameters are available, such as =, <=, <, >, <, and so on. Wildcarding is handled just like Atari DOS, with the ? and * symbols providing single character and multiple character strings. Sorting allows up to 4 fields with truncation of strings in either ascending or descending order.

One of the features (if not THE feature) that sold me on Data Perfect is the fact that it is 100% machine code and entirely RAM-resident. You boot up with the Data Perfect program disk, and then put it away for good. All functions and utilities are loaded and ready to go - no swapping back and forth between program and data disks. In fact, it is possible and easy to load the program disk the first time, and then work on several different databases without reloading the program. And I don't need to tell you what machine code vs. Basic means -- Data Perfect is FAST, very fast. When I am in my articles database, I can find any desired article out of the 300 or so I have entered in under 3 seconds if it is in the first half of the database, and in under 20 seconds if it is in the second half (Data Perfect only keeps the first 150 or so records in core at any one time; it must read in the second half of my database to search those records).

After you have booted up the program disk, you are asked how many disk drives you have. This is an excellent feature that I wish more business programs would offer (such as the Atari Personal Finance System). Data Perfect requires you to have both a data disk and a backup disk, and some of the functions, such as sorting, require both disks. If you have 1 drive, the program prompts you for the necessary disk. If you have 2 drives, drive 1 has the source disk and drive 2 has the backup. Data Perfect then asks you for

continued

today's date. This date is used for 3 functions that I have found so far. First, the databases are automatically updated with the date of creation and the date of last use. Second, any field which is a date field can use the current date as a default value. Third, a date field can be specified on a printed report which will also use the date automatically.

After the number of drives and date are entered, Data Perfect displays the primary menu. From here the user can elect to load, create, or update a database, go into the utility functions, print reports or mailing labels (yes, a built-in feature), change the drive/date information, or quit. Again, since all of the above functions are RAM-resident, there is no delay in going from one selection to another.

All the bells and whistles are included for entering and editing data. As each record is entered, it is written to the disk. The return and tab keys jump from one field to the next. Several editing functions are also included, such as the ability to enter only part of a line of data, go to the beginning or end of an input line, delete or insert characters, clear an entire line, and shift lock/unlock. The Break key returns you to the primary menu at all times (a nice touch, although I have had a problem of hitting Break instead of Delete and wiping out the record I was entering). When saving a record, a choice can be made to either clear the fields for the next record or save the old data on the screen, allowing for faster input of similar records.

So, with all of the nice features of Data Perfect, why the reservations? My number one problem was with the documentation. Although packaged nicely, it was in many areas vague. Granted, the copy I have is marked PRELIMINARY, but it is still hard to use in spots. The sections on creating, loading, and updating the databases are acceptable but could use a few more examples. The section on reports, however, is almost incomprehensible. It starts out saying that the report generator should be very easy to use for anyone who is familiar with RPG (a report-generating language on medium size mainframes). I found this statement to be rather hard to swallow. How many Atari users are going to have such experience - many have never had any prior experience with any computer before their Atari. I found this

section to be very difficult to use. I made a call to LJK Enterprises, and was told that the preliminary documentation is all that is available at this time, and when the final version is released, the repackaged Data Perfect will probably have a higher price. Current owners of Data Perfect should be able to get the new documentation for a small charge, although no final decision had been made as of yet. This bothers me somewhat, for I feel I will be paying extra for what I should have received in the first place; good, helpful documentation. Oh well, since another business software company repackaged their product at a higher price, it is not surprising that others will do so.

The other problem which I encountered was that the sort function simply did not work properly with more than 65 records. Another call to LJK informed me that some of the released versions had a bug in them, and returning my disk to LJK got me a new copy in about a week. This copy worked satisfactorily. I have experienced a few other problems (such as merging files), but found they were errors on my part due to the poor documentation.

All in all, this is an outstanding program that only lacks better documentation to be a real winner. The functions work and work fast. The program itself is user-friendly without burying you under 10 levels of unnecessary hand-holding. Once you figure out what the documentation is trying to tell you, Data Perfect becomes a powerful addition to the home environment. With Data Perfect, VisiCalc, and a good text-editor, the Atari can really show something to all those people who say that it is only a game machine. Your biggest choice is going to be to buy Data Perfect now or wait for better documentation at a higher price. Take it from me; don't wait. Get Data Perfect now and enjoy using a professional database system. (M)

Data Perfect requires an Atari with 48K and at least one 800 disk drive. A printer (either an 825/Centronics 737 or Epson MX80) and a second disk drive are optional but a definite plus.

GAMBITS

By Eric Chodun



SHAMUS

by Synapse Software

Rating - Good

You are an adventurer finding keys and getting points. There are different colored keyholes and you must find the right key to fit in that keyhole. If you succeed in finding the right key, a secret passage will open. You're traveling through a maze with electrified walls and different types of robots. You only have one weapon you could use against the robots which is a laser gun. Every time you hit the walls or get hit by a robot you lose a man. You get four men at the beginning and in the maze there is little potions. If you get a potion you will receive an extra man. There are four levels of thirty-two rooms each. In the last level you shall find out the answer to the puzzle. There are also question marks in the maze which will result is an extra man or points or danger. Shamus has good graphics and nice sound.

CANYON CLIMBER

by Datasoft

Rating - Good

You're a mountain climber, mining bridges, jumping arrows, jumping pits, and more. There are three levels in Canyon Climber. The first level you must mine each bridge and then blow them all up. There is a hazard though. Billy goats walk across the bridges and they try to hit you. If they hit you, you die. In the second level there are Indians firing arrows at you and you must jump the arrows or get a shield and get to the top of the screen. The shield wears off after a while so an arrow might hit you. If an arrow hits you, you lose another man. I don't want to tell you the third level because that might ruin the game. Canyon Climber has good graphics and a little bit of sound.

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PREPPIE

Designed by Russ Wetmore for Adventure International (floppy disk and cassette for Atari 400/800 computers with 16K RAM, \$29.95)

by Sheldon Leemon

"Look Muffy, a game for us", proclaims the smart green-and-pink cover of Preppie, but even if your name is Igor, and the thought of Madras plaid makes you break out in hives, the odds are still good that this game is for you. In a field dominated by noisy space shoot-em-ups, which leave in their wake sprained wrists and frayed nerves, it is refreshing to find an arcade game with the wit and style to qualify as a genuinely enjoyable and relaxing leisure time activity.

This is not to say that the bug-eyed gamer will turn up his nose at Preppie. On the contrary, he will be delighted to find that the basic game play resembles that of the arcade favorite Frogger. But, through a little computer magic, this is a Frogger transformed—not into a handsome Prince, but rather, into the nearest American equivalent of that sacred British institution, the Upper-Class Twit. The game replaces the premise of a poor little amphibian hopping the gauntlet on a superhighway, with that of an amiable dolt trying to collect golf balls without getting run over by lawnmowers and golf carts. This simple change in story line lightens the tone considerably, and at the same time, makes for better internal consistency (who ever heard of a frog drowning, as happens in Frogger?).

Like all good arcade games, the object of the game is simple to understand, and hard to achieve. On the first level of play, only three rows of mowers moving back and forth across the lawn prevent you from reaching the golf ball, picking it up, and returning. If you survive without mishap, you must pick up an additional ball on the far side of a river, which can only be reached by hopping from one moving canoe to another. On the next go-round, one row of lawnmowers is replaced by faster moving golf carts, and subsequent levels of play introduce a third golf ball and new obstacles, such as tractors, logs, alligators, even a killer frog (probably angry

over losing top billing). You start each level with a limited amount of time, and if it runs out before you have retrieved all balls, your Preppie perishes. The faster you accomplish the task, the more bonus points are awarded, and scoring 8000 points earns an extra backup Preppie, to add to the three you start with. The level of difficulty gradually increases over ten levels of play, making it unlikely that you will master it in a short time.

The graphics are not only superbly professional, but their cartoon-like style compliments the game's theme. In this area, Preppie showcases the abilities of the Atari computers, by presenting a multitude of medium-to-high resolution animated figures in up to 20 colors at once. Even more impressive is the musical accompaniment. Most arcade games are limited in their sound effects to irritating laser blasts and explosions. But Russ Wetmore, who designed the game, has an extensive musical background, and has fashioned a remarkably entertaining medley of "Strolling Through the Park One Day", "Humoresque", and "Down Among the Sheltering Pines". This soothing combination almost totally counteracts the tension induced by the fast pace of the game. Even at higher levels of play, where tempers usually flare, the music suppresses the player's natural urge to break something when human error prematurely ends the game. A pleasant side-effect is that it also soothes the nerves of the player's spouse—in my house, it's one of the few games that does not produce an ultimatum from the War Department.

The author has paid a lot of attention to the little details that make a game easy to play. One or two players may play at the same time, and they can share the same joystick, or each use a separate one. The game can be restarted at any time, and the action may be temporarily paused. Even when the action is fastest, the game is not fatiguing, and holds up very well to repeated play. You may start the game at any of the first nine levels of play, allowing you to practice more difficult levels, and to skip the early ones when they become too easy. Level ten is said to have a "special surprise" that will be revealed only to those who reach that elevated plateau. Although I guess I'm supposed to say that I won't tell you what happens because it would spoil the secret, the truth is that I've never gotten to level ten, so I don't know. (M)

SYMTEC LIGHT PEN

Reviewed by Marshall Dubin

No, its not some kind of low calorie BIC. The Symtec light pen is in fact, a sophisticated computer peripheral, designed to help bridge the gap between computer and human being.

A light pen is a device which can "read" the signal on a television screen. This signal is interpreted by your computer as an X,Y location, and as a result, the computer is capable of knowing exactly where the pen is pointed on your TV screen at any given moment. Knowing this, the software in your Atari can react to the position of the light pen, and perform accordingly.

Light pens are useful in many different applications. For example, in programs featuring menu options, the user has only to point the pen at the selected option. The computer, by reading the X,Y coordinates of the pen can branch to the option selected. A typical program might be structured like this:

...POSITION and PRINT to the screen:

```

O  Selection A
O  Selection B
O  Selection C

```

Touch pen to your selection

...IF PENx=20 THEN SELECTION A

...IF PENx=40 THEN SELECTION B

...IF PENx=60 THEN SELECTION C

(the Y coordinates are all the same in this example)

There are also numerous educational applications. For example, a pre-schooler might use the pen to select between different letters, numbers, words, and shapes. Light pens are also used for industrial training, graphics design, medical applications, and much more. They are especially suited for applications with the handicapped, since they

are easier to manipulate than a keyboard or joystick. For example, you could display the letters A-Z, and the user could point the pen at them one at a time. The computer would accept them, possibly put them into a command string, and thus one could interact with the computer without ever needing to use keys. To someone with limited physical ability, this would be useful.

The Symtec light pen is a well built piece of equipment. The pen itself consists of a stainless steel round barrel connected to a five foot coiled "telephone type" cord. This terminates in a connector which matches the front ports of the Atari. When I said well built, what I mean is that it's built like a tank. I think it would survive a drop off the Empire State Building. Included on the pen is a "touch ring" switch. This sends a signal to the computer which can be used to alert the program that the user has selected something. The switch is read by PEEKing the joystick of the port it is connected to. If STICK()=7 then the switch has not been pressed. It will read 15 if pressed. Your software can either use or ignore this flag, but it is a handy thing.

The light pen works by reading the TV screen. Basically, a TV picture is put on the screen by a "beam" of electrons. This beam starts in the upper left hand corner of the screen and scans accross each row horizontally. When it finishes a row, the beam jumps all the way to the left and down to the next row. It then scans accross that row. When all rows have been scanned, the beam jumps back up to the upper left corner to begin again. The process happens 60 times a second, so to your eyes it looks as if there is continuous picture. Actually, as the beam scans, it lights up one small spot on the screen at a time. This is turned off when the beam leaves it to scan the next spot, etc. So for any given moment, only one tiny part of the screen is actually lit. This is a ON/OFF situation, especially suited for use with a computer.

When the beam lights up part of the screen, a light sensing device in the pen sends a pulse to the STRIG pin of the Atari. This is pin 6 of the front port jacks. This updates the light pen registers. The Atari will internally interpet this information and can calculate the exact position of the electron beam. This is placed into the Atari light pen registers

continued

located at 564 and 565 (decimal). Location 564 contains the horizontal location of the beam and 565 the vertical position.

So, the light pen detects the TV beam, and this tells the computer exactly where your pen is pointing. Thus the exact position of the TV beam is known. So now what? Here's what a typical skeleton program would look like:

...CLEAR AND READ PEN REGISTERS

```
100 POKE 564,0:POKE 565,0
110 X=PEEK 564:Y=PEEK(565)
```

...USE THE DATA AS YOU SEE FIT

```
120 IF X=200 AND Y=90 THEN ...
130 IF X=80 THEN ...
```

The IF/THEN statements can be used to branch to a routine, plot or draw a graphics screen, turn on a relay, or you name it.

Symtec gives you a couple of routines to get you started, and really, once you play with it for a while it is easy to use in your programs. Except for the two or three demo routines, the manual really doesn't give you much else. Since the pen is powered from the Atari, just plug it in and use it.

When calibrating your pen to the screen, use the statement:

```
10 PRINT PEEK(564),PEEK(565):GOTO 10
```

This will tell you the pen's location. Knowing where you will want the user to point the pen, just note the values from 564 and 565 in your IF/THEN statements. Then if the values returned by the user while pointing the pen match the values you have pre-recorded and entered in your IF/THEN statements, the computer will branch accordingly.

Although the manual says that the pen will see the screen with a resolution of plus or minus 1 pixel, this does not necessarily translate into Atari terms. For the Atari, each graphics mode is said to have different pixel sizes. The readings you get back from locations 564 and 565, though do not change with the graphics modes. For example, location 564 will give you a reading of between 71 and

228 regardless of the graphics mode you're in. This is because, what is being interpreted is the horizontal "color clock" value. I am not going to dwell too much on this (see Craig Chamberlain's series in COMPUTE! for an excellent explanation of how a TV beam works, as well as the new GTIA), but basically a color clock is a unit of measure for the time it takes the TV beam to scan horizontally across one line. This is what is being read into the Atari register. Therefore, if you want to translate this into a particular pixel size for a certain graphics mode, you will have to manipulate the register value to correspond with the pixel size you select.

The examples provided by Symtec show how to draw in modes 7 or 8. Mode 7 needs no translation, since the number of horizontal pixels almost matches the color clock count in the light pen register. Mode 8 requires that you multiply the pen register value by 2. Other low res modes may require a table to translate color clock value into pixel sizes. This is mostly used for drawing purposes. For detecting the beam as in a menu or user selection program, just knowing the register values and including the actual values in your IF/THEN statement will suffice. Incidentally, the manual does not go into this. (Hmmm, maybe some potential for an article?).

Symtec provides a one year warranty. They will pay everything for the first 90 days, and after that you pay only labor charges.

All in all, if you are a serious computer enthusiast, this is an excellent addition to any system. The price is \$150.00. I have seen cheaper pens, but this thing is so well built and professionally designed, it is well worth the price. ⑦

For more information, contact Symtec Inc. 15933 W. Eight Mile Road, Detroit, Michigan 48235. Phone (313) 272-2950.

NOTE: Symtec has offered the pen to MACE members (sorry, members only) for the price of \$105 through the end of September. If interested, make check out to SYMTEC and send it to LIGHT PEN, 2639 Hempstead, Auburn Heights Michigan 48057. (Interested members can call me at 569-4000, ext. #295 during the day for more information.)

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THE THUNDER OF HOOVES AND THE CLASH OF SWORDS!! also known as THE SHATTERED ALLIANCE

reviewed by Richard L. Staff

Strategic Simulations, Inc. brings ancient warfare to the modern day Atari computer user. For only \$39.95 and an Atari computer with 48 K of memory, basic cartridge, and a disk drive, you can mount your imaginary war horse and ride off to do battle most deadly.

The Shattered Alliance is a tactical level simulation of several fantasy and ancient battles. It comes packaged in an eye catching game box, a nice touch for us old wargamers use to boxed games. The rule book is well organized, readable, and illustrated. The game also includes two Command Cards, one Combat Data Card, and one Player Introduction Card (provides a quick intro to using this computer game). A human can watch the computer play against itself, or play against the computer, or play against another human.

Seven battles (also called scenarios) are represented on the game disk. Scenarios one through three relate to the Chronicles of Osgorth; Osgorth is a fantasy world located somewhere in the Andromeda galaxy. Besides humans other sentient races include centaurs, elves, dwarves, unicorns, hozgits (pig-like), zorgs (subhuman, orc-like), and caco-daemons. The rule book provides a psuedo-history for the planet Osgorth which helps place the battles in "historical" perspective. Magic creeps into scenarios two and three (two player version only). Scenarios four through six relate to ancient earth history, while scenario seven occurs on middle-earth, i.e., the battle at the gates of Mordor.

To get one of the scenarios up and running in the computer requires four separate disk-to-computer loads, taking about five minutes total time. I hate to imagine how long it would take to load a cassette version. The initial load is the title screen with credits, a simple press on the return key starts the second load. At the end of the second load, you are presented with a three choice menu,

i.e., play a new game, play a saved game, or watch a demonstration game. In response to your choice, the computer presents a list of the seven scenarios (battles) available. They include the three that relate to the Chronicles of Osgorth (Ambush of the Unicorns, Battle of the Two Kingdoms, and Defeat of the Beasts) and four more labeled "Designer Series" (Carthage vs Alexander the Great, Romans vs Vikings, Xeres vs Genghis Khan, and Gondor vs Mordor). The third load starts when you make your scenario choice and hit return. After the third load, you can review the army rosters for both the Left Side (white) Army and the Right Side (blue) Army. Then you must name the Commander-In-Chief of your army, typing in "C" activates the computer player for that army. You next set the Command Countdown Timer, choose whether you will see a detail display of morale and combat calculations, and select the skill level for solitaire play and the size/training class of the computer's army. The computer now makes its fourth and final load; the battle map is displayed after this load.

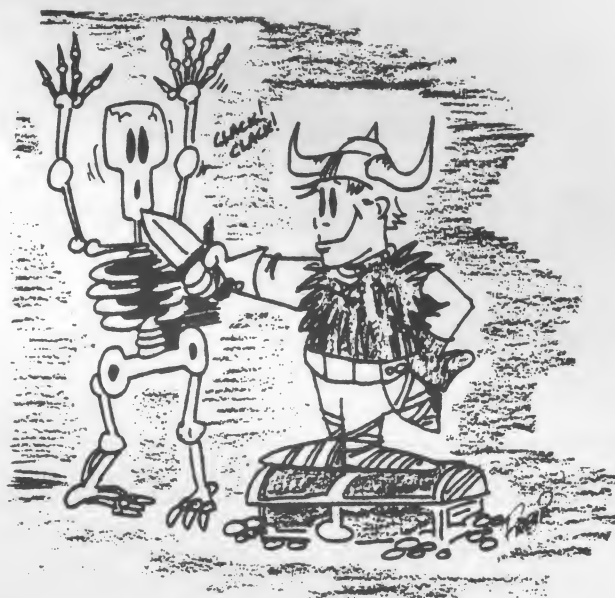
Any single scenario plays suprisingly fast, about 20 to 60 minutes. This is pretty good for a basic program. A real-time game system (called Rapidfire) is used that charges each unit a certain number of time-points for any action or movement it makes. A unit only gets to act/move when a predetermined number of time-points has passed (based on its previous action/movement). Depending on its type, each unit on its turn may be able to engage in missile fire (javelins, rocks, or bow), movement, and/or melee combat. Combat is resolved on a unit vs unit level. There are several types of units available, including Heavy Infantry, Light Heavy Infantry, Medium Infantry, Light Medium Infantry, Light Infantry, Extra Heavy Cavalry, Heavy Cavalry, Light Cavalry, and missile equipped units.

I find Heavy (or EH) Cavalry good for shock attacks against foot soldiers (Infantry). Missile units are especially good when coordinated in a crossfire against a single enemy unit; they can also be used for a quick hit and run. Multiple melee attacks against a single unit help reduce the enemy army's morale and may cause that unit to rout. Careful entry of commands at the keyboard is important too, I have lost battles due to the anxious pushing of a key (nothing so frustrating as to see one of your units do the

continued

unplanned for). Hitting the enemy first and hard helps getting the morale calculations going your way.

In summary, The Shattered Alliance is a good computer wargame package. It has excellent documentation, good battle map graphics, fast playing scenarios, and variety. I rate it a B+. It does not have battle sound effects like Eastern Front (that's why I choose to have both morale and combat calculations displayed), and it requires several disk loads to get into a scenario. It appears to have adequate error trapping. ④



ERROR... ERROR... ERROR

Last month's article of MIDNIGHT STRIP had a few bugs in it. In line 1211, FS\$ cannot be built using the method mentioned last month since some of the characters are control characters and will execute in the string rather than sit there. This routine will build the string properly. Just have line 1211 say: GOSUB 10000. Note that this program is now available in the MACE library if you want to save some typing.

```
10000 ? CHR$(125):? :RESTORE 10000
      ? "1211 FS$=";CHR$(34);
10010 FOR I=1 TO 56:READ A: ? CHR$(27);
      CHR$(A);:NEXT I: ? CHR$(34):RESTORE:
      POKE 84,0:RETURN
```

```
20000 DATA 104,104,133,209,104,133,208
      104,141,255,6,104,141,254,6,104,104
      168,162,0
```

```
20010 DATA 152,129,208,56,173,254,6
      229, 208,208,8,173,255,6,229,209,208
      1,96,24
```

```
20020 DATA 169,1,101,208,133,208,169
      0,101,209,133,209,169,0,240,220
```

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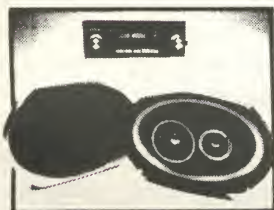
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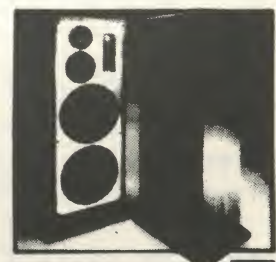
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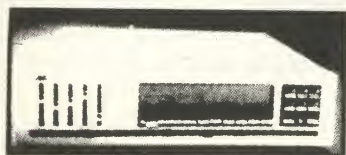
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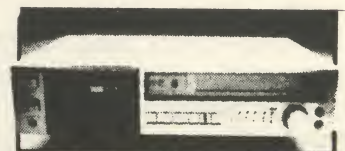


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SCREEN DUMP for GRAPHICS MODE 9

by Edward Schultz Jr.

This program will allow you to dump a graphics mode 9 or 11 screen to an EPSON printer with GRAFTRAX-80 or GRAFTRAX-PLUS installed. The program only needs to be appended to the end of the program that generates the screen which you desire to be copied to the printer.

Graphics mode 9 on the ATARI (with GTIA) allows 16 intensities of any one color to be plotted on the screen in a 80(X) by 192(Y) matrix. The 'dots' that are plotted in mode nine are rectangles that are four times as wide as they are high, or basically four graphics mode 8 'dots' next to each other horizontally. Similarly, graphics mode 11 'dots' are the same shape, but they are displayed as 16 distinct colors, all with the same intensity.

The problem that occurs in copying these types of graphics screens to a printer is in finding a way to represent 16 intensities or colors on a printer which only prints in black and white. The solution is to use a technique similar to what newspapers do for printing pictures. That is, numbers of black and white dots placed close to each other appear grey to the eye. By varying the ratio of black to white dots, varying shades of grey are obtained. To obtain 16 different shades of grey, 16 dot patterns are needed. This program uses a pattern of two rows of eight dots to obtain 16 dot patterns, and maintain the 1 by 4 size ratio of the graphics mode 9 and 11 'dot'.

The first line in the program listing dimensions room for the string which will hold the dot patterns for the 'grey scale', and for the buffer that will hold the data for the EPSON. The next step is to insert a prefix into the line buffer for the EPSON that tells the printer that the 384 bytes following should be printed as dot graphics characters. Line 1100 is where GREY\$ is initialized. Unfortunately, GREY\$ is almost all ATARI graphics characters, which don't print very well on a printer. GREY\$ must be created by entering the characters described in the

following REM statements between the quotes on line 1100. For example, (INV\ESC\CTRL >) means to press the 'ATARI' key to get inverse characters, then press the 'ESC' (escape) key, then hold down the CTRL key and press the > key, press the 'ATARI' key again to get back to normal characters. There should only be enough characters to fill the space between the double quotes on line 1100. In line 1160, the printer is opened for output, and in lines 1210-1220 three lines are skipped, and then the line size on the EPSON is set to a line 8 dots high. Finally, in the main loop of the program, the screen is read in vertical stripes from top to bottom, with each screen dot converted to a double byte dot pattern according to its intensity. The program is entered by executing a GOSUB 1000 in the BASIC program which creates the graphics screen. The program may be renumbered to fit anywhere in your existing program, as long as the GOSUB which calls the program points to the first line of the screen dump program. To complete a screen dump it takes about 13 minutes. ☺

```

1000 DIM GREY$(32),BUFFER$(400)
1020 REM TELL PRINTER NEXT 384 BYTES
1030 REM ARE DOT PATTERNS
1040 REM ( 192*2=384)
1060 BUFFER$(1)=CHR$(27):BUFFER$(2)="K"
1080 BUFFER$(3)=CHR$(128):BUFFER$(4)=
CHR$(1)
1100 GREY$="
1110 REM GREY$="(INV\ESC\CTRL > )(INV\ESC\CTRL >
)(INV\CTRL ; )(INV _ )
1120 REM (INV\CTRL ; )(INV ^ )(INV N )(INV 7 )(INV [
)( N )(INV ] )( F )
1130 REM (INV Y )( F )(INV x )( U )( & )(INV\CTRL Y )(
$ )(INV\CTRL Y )( $ )
1140 REM (INV\CTRL Q )(CTRL Q )( H )(CTRL D )( A
)(CTRL D )(SPACE)(CTRL , )
1150 REM (CTRL P)(CTRL , )(CTRL , )"
1160 OPEN #7,8,0,"P:"
1180 REM SET LINE WIDTH TO EIGHT DOTS
1190 REM AND SKIP THREE LINES
1210 PRINT #7:PRINT #7
1220 PRINT #7:CHR$(27);"A";CHR$(8)
1240 REM READ SCREEN IN VERTICAL STRIPES
1250 REM AND GENERATE BUFFER$
1270 FOR X=79 TO 0 STEP -1
1280 P=5:FOR Y=0 TO 191
1300 LOCATE X,Y,A:PTR=A*2+1
1320 BUFFER$(P,P+1)=GREY$(PTR,PTR+1)
1330 P=P+2
1340 NEXT Y
1350 PRINT #7;" ";BUFFER$
1360 NEXT X
1370 CLOSE #7:RETURN

```


HOW TO WRITE A PROGRAM

By Dale Eisenberger

Part II

Most beginning programmers start out going to the keyboard with an idea, sitting down, and coding a program on the fly. For very simple programs this process is adequate, but anything of quality needs definition and design before beginning to code.

Don't be afraid to spend most of your time defining what you want to do in great detail. Until you have these details, you cannot design the structure of the program. And don't be fooled, you are creating an order from the uncountable variables, and syntax rules, and randomness of the Atari universe. Writing a program takes a great deal of effort. Reward yourself early.

In Basic, to speed programs up, the language requires subroutines, (and some programmers feel FOR/NEXT loops and GOTO's should be in the front of the program. The nature of the system says that when the program does any branching, it has to go back to the beginning of the program to find where it left off. This is not good for beginning programmers. It disturbs the logical sequence and flow of the program, for the sake of decreasing the run time of the program. I feel that the most emphasis should be on organizing the program in such a fashion that it is easy to find logic errors, and easy to understand. Once the program is working correctly, you can begin to rearrange it to make it run faster. Yes, it is harder to retrofit time-saving code, but you will then only have to test the speeding up of the code, not the work of the program itself.

When you look at a double-layer, double chocolate cake, your mind often wishes it could engulf the entire cake with a single gulp. Speaking from past experience, let me assure you IT WON'T WORK! You have to cut it down to size. Cut the cake into sections for each person at the table. Some people want a large slice, some a small slice. In the same way, you must divide you program into sections. A section of code to set switches and values will probably be smaller than a

section that processes a particular type of record. Just as a whole cake is too much to eat in one bite (excuse me, bite), a piece of cake is also too much. We have to take a fork to it to cut it down to a size we can eat. Your section of code has to be broken down to a size where you can know all the variables that affect this section of code, what this section of code will do to these variables, and where in the program will the computer go next.

TO SUMMARIZE:

1. Spend most of your time defining and designing what you want your program to do in great detail.
2. Getting the program working correctly comes first; worrying about the time it takes to run the program comes later.
3. Cut your program down into the smallest logical sections, until you understand everything about that section.



Editor's note:

This article originated on CONFER, a computer conference. CONFER is one of the many features available on the Michigan Terminal System (MTS)—an inter-computer system linking many universities, businesses, and individuals in Michigan, Canada, and anywhere else a modem will travel. The article is recommended for intermediate or advanced users.

RS-232 Tutorial

Part 1

By Jon Tara

General Characteristics (DCE-DTE Distinction)

Every microcomputer user has had to tangle with RS-232 at one time or another, and it is usually not a pleasant experience. Even those of us with years of experience in the field get confused at times.

This is the first of a short series of ITEMS intended to explain the basics of RS-232 interfaces, and some of the common "tricks" that can be played to make life easier when trying to get one RS-232 device to talk to another.

RS-232 is an Electronic Industries Association standard calling out electrical and operational characteristics for a serial interface between Data Terminal Equipment (i.e. Terminals) and Data Communication Equipment (i.e. Modems). Surprisingly, RS-232 does **not** call-out the TYPE of connector to be used, although it **does** call-out pin numbers. Fortunately, this has never been a problem. The de-facto standard connector for RS-232 is the DB-25 series of connectors.

The standard calls for a female connector on DCE (modem) interfaces and a male connector on DTE (terminal) interfaces. Unfortunately, this is a poorly adhered-to aspect of the standard: many terminals use female connectors, even though they are wired with a DTE interface.

Now you may begin to smell something

fishy here: what do you do when you want to connect something (a terminal or a modem) to a **computer**? Well, according to the standard, YOU DON'T!

Of course, it's done all the time, and this is where things get **really** confusing. A computer port may be set up to "look like" either a DTE (terminal) interface or DCE (modem) interface. Burn this into your brain right now!

"A DTE interface "looks like" a terminal"
"A DCE interface "looks like" a modem."

And oops, sorry perns, you've gotta match them up in pairs.

"A DTE cannot talk to another DTE"
"A DCE cannot talk to another DCE".

(There is a way around this, and I'll discuss it in another ITEM.)

So, before you plug an RS-232 device into your computer, you've got to decide what your computer "looks like". The connector situation is even more confusing with computer than with terminals. (I've found that you can hit right 60% of the time by going AGAINST the standard...) The best bet is to check your computer manual. GENERALLY, though, mini and micro-computers will be set up as DCEs, so that they can talk to a terminal. (M)



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DOWN MEMORY LANE

by Sheldon Leemon

I finally got some feedback on the column! And while a lot of it was just wondering why the buggy old GET BYTES-PUT BYTES CIO routines didn't work, some interesting questions were raised, and so I guess I'm not quite through with that topic.

Question number one dealt with line 1010,PUT #1,PEEK(939). Some members found that the PEEK did not save the graphics mode number as intended. Well, I forgot to mention that while PEEK(939) will contain the graphics mode number immediately after the GRAPHICS statment, when you use PLOT and DRAWTO the number gets changed. Therefore, unless you save the graphics mode number before the PLOTs and DRAWTOs, it is best to change that line to PUT #1, MODE_NUMBER, where MODE_NUMBER represents the number of the mode you are using. And if you have tried reading some of the files that were created with the wrong mode number in the first byte, you can read them fine by changing the statement in the Read program from GRAPHICS A to GRAPHICS whatever number is appropriate.

The second question came from Pat Warnshuis, editor of the Portland Atari Club newsletter. He wrote a program to copy the ROM character set to disk using the PUT BYTES routine, but when he tried to read the file, he kept getting Error 164, Sector Link Mismatch. Well, another thing I forgot to tell you is that you can't use the routine to write bytes from ROM. Why not? Because the DOS routine cleverly tries to add the sector link information after each 128 bytes right to your buffer, so it can then copy the whole sector out, link info and all. Afterwards, it restores your buffer information, substituting what was originally there for the three byte sector link data. With a program in ROM, it will try to swap in sector link information, but of course nothing will get written. As a result, the last three bytes will be the original ROM data, and not the sector link info needed by DOS to read the file. Voila, instant sector mismatch! The other bad part of this sloppy coding is if something happens to the system before it restores your original data, you are stuck with sector link information in your

code, thus making you pay for DOS' mistake. These problems are treated at length in the July issue of COMPUTE, in Bill Wilkinson's column, under the heading of Burst I/O. A subtle feature of Marcus Watts' K-DOS, which I did not mention in my review last month, because I felt it was too technical, is that it first writes the data for a sector to a buffer, before it adds the sector link information and copies it to disk, so that if the routine blows up, your code doesn't go with it.

While not really a question, Dave Menconi at Atari says that I should have mentioned that the CIO routine is excellent for transferring machine code subroutines from a disk file to page 6 or wherever. Consider it mentioned.

Well campers, keep in touch, and we'll have more surprised later. ☺

REVISION B ROM TEST

Reprinted from the Jersey Atari Computer Group
Newsletter - May,1982

By Ken Roser

```
10 REM REVISION B ROM TEST
20 REM
30 REM PROGRAM WILL READ EVERY LOCN
40 REM IN THE 10K OS ROM AND CALC
50 REM A CHECKSUM FOR THE DATA.
60 REM CHKSUM IS PRINTED FOLLOWED
70 REM BY EITHER A PASSED OR FAILED.
80 REM
90 REM CORRECT CHECKSUM FOR REV.B ROM
100 REM IS 235
110 REM
120 CLR :DIM M$(1),M(29):GRAPHICS 0
130 ? :FOR Y=1 TO 29:READ N:POKE
   ADR(M$)+Y,N:NEXT Y
140 X=USR(ADR(M$)+1)
150 ? "CHECKSUM IS ";X
160 IF X=235 THEN ? "PASSED"
170 IF X<>235 THEN ? "FAILED"
180 END
190 DATA 169,216,133,204,169,0,133,203,
   168,24,113,203
200 DATA 200,208,251,230,204,208,247,
   141,212,0,169,0,141,213,0,104,96
```

PROGRAMMING PUZZLE

By Guy A. Hurt

As a member of Capitol Hill Atari Owners Society (C.H.A.O.S.) in Lansing, and a COBOL programmer for the State, I am proud to run items of interest in this excellent publication. Today, I wish to discuss three of the specialized variables that we programmers use in the DP (data processing) world and then I'll let you tackle a small problem.

The specialized variables that I briefly wish to discuss are: COUNTERS, SWITCHES AND SAVERS.

Counters are used to count up items of interest. In many cases, these items are records but they can also be particular circumstances or events. A typical BASIC statement to update (i.e., to add one to) a counter might be: 100 COUNTER=COUNTER+1

Switches are generally used to indicate whether or not a certain condition or situation is in effect or not, or has occurred or not. It is not uncommon for these switches to work in a binary fashion with zero meaning the event has not occurred (or is not in effect) while a one means it has occurred (or is in effect). A typical BASIC statement to turn a switch "ON" (i.e., indicate that the event has occurred) might be: 100 SWITCH=1

Savers are generally used to save the value of a variable for future comparison purposes. An example of the use for a save variable is a program that's looking for the largest number in an arbitrarily long list of numbers. A typical BASIC statement to save the value of a variable might be: 100 SAVARIABLE=VARIABLE

With all of the above in mind then, let's move along to that little problem I promised you. It reads as follows:

Write a BASIC program (with only 1 READ statement, only 1 PRINT statement and no ARRAYS or TABLES), to read in a series of integers and list out the first number regardless and all the even numbers thereafter...

- unless the current number read in is NEGATIVE, then list out the number if it is odd...

- unless the last number listed was larger than the square of the number that followed it in the input list

- and that at least three such numbers have been listed...

- and that the absolute difference between the number of numbers listed and the number of numbers read (excluding the current number) exceeds two...

- and that the number of numbers read prior to the current number that were not listed does not exceed three...

...then by all means do not list the number, otherwise do so.

After the last number in the input has been processed, execute the following logic:

```
1000 SOUND 0,150,10,10
1010 FOR I=1 TO 100:NEXT I
1020 END
```

The signal the above logic produces lets you know you are done. Run your program twice with the following sets of data:

```
DATA SET 1 --- -8,-8,-1,2
-1,2,-1,2,-1,-2,2,-1,-4,4
-1,2,-1,4,-2,1,0
```

```
DATA SET 2 --- 7,5,3,1
```

By the way, consider zero to be both even and positive.

Now I know the problem reads like a mixed bag of words. But if you go through it slowly, and break it up into smaller pieces, you'll see that it's not so bad.

Please send your program solutions to:

GUY A. HURT
P.O. BOX 12195
LANSING, MI. 48901

The first person to submit a correct program solution, documenting the program listing, will receive a free MACE disk or tape of their choice.

* All entries must be postmarked no later than midnight, September 6, 1982. Winners will be notified by mail or in person.

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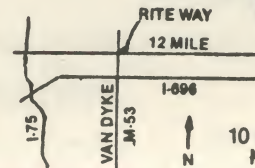
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